Please substitute the paragraph beginning at page 2, line 6, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The pattern linewidth of next generation semiconductor integrated circuits will be about 100 to 70 nm. As regards the exposure beam wavelength region, an F_2 excimer laser having a wavelength of 157 nm, shorter than that of an ArF excimer laser, is expected. --

Please substitute the paragraph beginning at page 2, line 11, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- However, it is known that, when a short wavelength exposure beam of an i-line or one shorter than it is used, the short wavelength exposure beam causes a photochemical reaction of impurities and oxygen in the air. The product of such a reaction is deposited on an optical element (lens or mirror) of the optical system to cause a decrease in characteristics such as optical efficiency, for example. This leads to a decrease in throughput of the exposure apparatus. --

Please substitute the paragraph beginning at page 2, line 20, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As regards the product, representative examples are ammonium sulfate $(NH_4)_2O_4$ to be produced, when sulfurous acid SO_2 absorbs light energies and is excited thereby, through reaction (oxidation) of the same with oxygen in the air, and SiO_2 to be produced, when a Si

compound absorbs light energy and is excited thereby, through reaction of the same with oxygen in the air. --

Please substitute the paragraph beginning at page 3, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Conventionally, in order to avoid such a product, an optical system is purged by an inactive gas. For example, Japanese Laid-Open Patent Application, Laid-Open No. 216000/1994 shows an apparatus wherein a barrel having glass members such as lenses are accommodated therein is placed in a housing of a closed structure and wherein the inside of the barrel is filled with an inactive gas. --

Please substitute the paragraph beginning at page 3, line 18, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- When F_2 excimer lasers are used for an exposure process, the following problems arise: --

Please substitute the paragraph beginning at page 3, line 20, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- It is known that, in the vacuum ultraviolet region near 157 nm, there is a continuous absorption band to oxygen. The characteristic differs from the region in which an absorption

band near 193 nm (ArF excimer laser) is present discontinuously. It is, therefore, impossible to choose an exposure wavelength of very small absorption, as an ArF excimer laser. --

Please substitute the paragraph beginning at page 4, line 13, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- A chemical filter may be used to prevent the supply of such a light absorptive material into the apparatus. However, replacement filters or maintenance thereof requires stopping the operation. This may cause a decrease of the throughput of the apparatus. --

Please substitute the paragraph beginning at page 4, line 19, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Further, when the concentration of such a light absorptive material in the light path changes during the exposure operation, a change (error) occurs in the actual exposure amount relative to a desired exposure amount. This may cause not only a decrease of the throughput but also a large decrease of the exposure amount control precision. --

Please substitute the paragraph beginning at page 8, line 2, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- In the drawing, a laser unit 1 which is a light source of the exposure apparatus is disposed on a floor or a room downstairs, separately from the exposure apparatus. The laser unit 1 comprises an excimer laser device for producing vacuum ultraviolet light of a wavelength

region not longer than 160 nm. In this embodiment, an F_2 laser having an emission wavelength of about 157 nm is used. However, in place of it, an Ar_2 laser having an emission wavelength of about 126 nm or any other light source for emitting a wavelength in the ultraviolet region as such may be used. --

Please substitute the paragraph beginning at page 9, line 13, and ending on page 10, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The reticle 8 is placed on a reticle holder 10 which is mounted on a reticle stage 9. The reticle stage 9 is made movable, by means of a reticle stage driving system (not shown), in the Y direction (scan direction) along a plane orthogonal to the optical axis. There is a bar mirror 11 fixed to the reticle stage 9. It cooperates with an interferometer 12 for measuring the bar mirror position, to measure the position of the reticle stage 9. In Figure 1, only one interferometer 12 is illustrated, and the stage is illustrated as being moved in the Y direction (scan direction) of the coordinates. However, another interferometer and another bar mirror may be provided in relation to the X direction in the coordinates, to perform the reticle stage position measurement in relation to the X and Y axes. --

Please substitute the paragraph beginning at page 10, line 10, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The wafer 14 is placed on a wafer chuck 16 which is mounted on a wafer stage 15. The wafer stage 15 is made movable by means of a wafer stage driving system (not shown) in X and Y directions along a plane orthogonal to the optical axis. There is a bar mirror 17 fixed to the wafer stage 15. It cooperates with an interferometer 18 for measuring the bar mirror position, to measure the position of the wafer stage 15. In Figure 1, only one interferometer 18 is illustrated, and the stage is illustrated as being moved in the Y direction (scan direction) of the coordinates. However, since the wafer stage has to move a wafer stepwise in the X direction after completion of the scan exposure, another interferometer and another bar mirror are provided in relation to the X direction in the coordinates, to perform the wafer stage position measurement in relation to the X and Y axes. --

Please substitute the paragraph beginning at page 11, line 6, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The stage base table 21 has a reference surface formed parallel to the X-Y plane. The wafer stage 15 described above is movable in the X and Y directions, along this reference surface. In this embodiment, the wafer stage 15 is supported relative to the stage base table 21, without contact thereto, by means of a guide which uses a gas bearing. However, the guide for supporting the wafer stage is not limited to a gas bearing. A rolling guide using balls or rollers, or a sliding guide, for example, may be used. --

Please substitute the paragraph beginning at page 11, line 17, and ending on page 12, line 13, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Mounted on the barrel base 22 are the projection optical system 13 and the interferometer described above, as well as an air-conditioning duct 23 and an outer casing 24. The interferometer 18 is supported by the barrel base 22 which supports the projection optical system 13, and thus it measures the position of the wafer stage 15 while taking the projection optical system 13 as a reference. The duct 23 functions to blow a gas, from a circulation system to be described later, in a direction perpendicular to the optical axis of the projection optical system 13, through an inside ULPA filter (Ultra-Low Penetration Air-filter) 23′. Thus, the duct 23 serves to stabilize the interferometer light path 18′ of the interferometer 18 and the wafer 14 as well as the space substantially encircled by the barrel base 22, at a predetermined temperature. As a result of this, unwanted fluctuation along the interferometer light path 18′ as well as unwanted deformation of a member due to a temperature change in the space can be reduced. Also, the duct 23 is effective to reduce the concentration of any light absorptive matters (e.g., oxygen) along the exposure light path, from the bottom end of the projection optical system 13, to the wafer 14. --

Please substitute the paragraph beginning at page 12, line 14, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The reticle stage 9 described above is movable in the Y direction (scan direction) (it may also be moved in the X direction) along a reference surface formed on the outer casing 24. In this embodiment, the reticle stage 15 is supported relative to the outer casing 24, without contact thereto, by means of a guide which uses a gas bearing. However, the guide for supporting the reticle stage is not limited to a gas bearing. A rolling guide using balls or rollers, or a sliding guide, for example, may be used. --

Please substitute the paragraph beginning at page 14, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- There is a chamber 26 which, in this embodiment, accommodates therein the main assembly of the exposure apparatus, and it has a tightly closed structure for intercepting gas communication with the outside atmosphere. There is a movable member 27 which comprises a bellows made of stainless steel, for example. It functions to connect the chamber 26 with portions adjacent to the legs 19, to thereby secure the tightness of the chamber 26 and also to allow absorption of relative displacement relative to the legs 19 or to the main base table 20. --

Please substitute the paragraph beginning at page 16, line 13, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas flowpassage inside the chamber 4 will be described with reference to Figure 2. Components corresponding to those of Figure 1 are denoted by the same reference numerals, and a description thereof is omitted. --

Please substitute the paragraph beginning at page 17, line 20, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The optical integrator 210 is supported by a supporting table 211 having a vent 212. The condenser lens 213 is supported by a supporting table 214 having a vent 215. --

Please substitute the paragraph beginning at page 18, line 24, and ending on page 19, line 17, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Further, as in the chamber 4, efficient gas replacement should desirably be done even at such a position where the optical path is bent or deflected. In consideration of it, in the present invention, as shown in Figure 2, a vent is provided outwardly of the optical axis being bent, like the vents 206 and 208, for example. In other words, the vents 206 and 208 are disposed so that, when viewed in a direction perpendicular to the optical axis being bent, a line connecting these two vents intersects the optical axis being bent. By providing two vents in this manner, particularly at the bent portion, the line connecting the two vents intersects, twice, the optical axis being bent. As a result, gas replacement about the light path in the axis-bent portion can be performed very efficiently. When plural vents are used, a line connecting at least one set of vents among them should preferably intersect, twice, the optical axis being bent, as viewed in the direction orthogonal to the optical axis being bent. Further, the intersection with the optical axis being bent may be single. --

Please substitute the paragraph beginning at page 19, line 15, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Referring back to Figure 1, a gas supply source 57 supplies an inactive gas which is, in this embodiment, helium gas or nitrogen gas. It is not always necessary that the inactive gas supplied from the source 57 be the same as the inactive gas supplied from the gas supply source 51. For example, the supply sources 51 and 57 may supply nitrogen gas and helium gas, respectively. Further, the gases supplied by them may have different oxygen densities. --

Please substitute the paragraph beginning at page 21, line 3, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas flowpassage inside the housing 6 will be described with reference to Figure 3. Components corresponding to those of Figure 1 or 2 are denoted by the same reference numerals, and a description thereof is omitted. --

Please substitute the paragraph beginning at page 22, line 19, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Although in this embodiment the gas discharged form the gas discharging port 60 flows directly into the chamber 26, the invention is not limited to this. The gas from the discharging port 60 may be directed to an optical system disposed along the light path, from the housing 6 to the wafer 14, for example, the projection optical system 13, and, after flowing through the projection optical system, the gas may be discharged into the chamber 26. --

Please substitute the paragraph beginning at page 23, line 19, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas flowpassage inside the projection optical system 13 will be explained with reference to Figure 4. Components corresponding to those of Figure 1 or 3 are denoted by the same reference numbers, and a description thereof is omitted. --

Please substitute the paragraph beginning at page 24, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The lens 402 is supported by a supporting table 404 having a gas discharging port 63. The lens 405 is supported by a supporting table 407 having a vent 406. The lens 408 is supported by a supporting table 410 having a vent 409. The lens 411 is supported by a supporting table 413 having a vent 412. The lens 414 is supported by a supporting table 416 having a vent 415. The lens 417 is supported by a supporting table 419 having a vent 418. The lens 420 as well as the above-described supporting tables 407, 410, 413, 416 and 419 are supported by a barrel 401. --

Please substitute the paragraph beginning at page 24, line 25, and ending on page 25, line 7, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Although in this embodiment the gas discharged from the gas discharging port 63 flows directly into the chamber 26, the invention is not limited to this. The gas from the discharging

port 402 may be directed to an optical system disposed along the light path, from the glass member 5 (Figures 1 - 3) to the wafer 14, for example, the housing 6 (Figures 1 and 3), and, after flowing through the housing 6, the gas may be discharged into the chamber 26. --

Please substitute the paragraph beginning at page 26, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas discharged from the distribution outlet port 74b is directed through a pipe 75b to a partial duct 25 and, as described hereinbefore, it is blown into the space adjacent to the reticle 8 and the interferometer light path 12′. --

Please substitute the paragraph beginning at page 26, line 13, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas discharged from the distribution outlet port 74b is directed through a pipe 75d to a partial duct 23 and, as described hereinbefore, it is blown into the space adjacent to the wafer 14 and the interferometer light path 18′. --

Please substitute the paragraph beginning at page 27, line 25, and ending on page 28, line 2, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Details of the first and second purifiers 104 and 105 will be described, with reference to Figure 5. Components corresponding to those shown in Figure 1 are denoted by the same reference numerals, and a description thereof is omitted. --

Please substitute the paragraph beginning at page 28, line 16, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The thus converted oxygen and the oxygen passed through the ozone converting means 502 are removed by the subsequent oxygen removing mechanism 503. The oxygen removing mechanism 503 uses iron powder, CaO and Cu mesh, and the like, to cause a chemical reaction (oxidation) by contact with oxygen in the gas, such that the oxygen is removed by attraction. Alternatively, a commercially available high-purity gas purifier may be used. --

Please substitute the paragraph beginning at page 28, line 25, and ending on page 29, line 12, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Since the inside of the chamber 26 has been replaced by an inactive gas such as helium gas or nitrogen gas, the oxygen concentration and ozone concentration are very low. However, even a very small amount of remaining ozone and oxygen (e.g., ppm order or lower) can be removed by the ozone and oxygen removing mechanism 501 described above. Here, the oxygen concentration in the chamber 26 may be set slightly high as compared with the ambience inside a closed space surrounding the light path of the projection optical system 13, the housing 6 and the

chamber 4, for example. Since the gas purity inside the chamber 26 may be set lower than the gas purity of the ambience surrounding the light path, the inside ambience control of the chamber 26 is made easier. --

Please substitute the paragraph beginning at page 29, line 23, and ending on page 30, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- However, if such a ceramics porous type chemical filter is once exposed to a high-humidity environment such as an atmosphere, it absorbs water (H_2O). If it is used in operation in such a state, there is a possibility that a gas with a water content is supplied to the chamber 26. --

Please substitute the paragraph beginning at page 30, line 17, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As regards the second purifier 105, on the other hand, when the switching valves 111 and 116 are closed, both the upstream and downstream of the second purifier 105 are shut (not shown). Therefore, replacement of the second purifier 105 or maintenance of it can be done. If, as shown in the drawing, the switching valves 111 and 116 are opened, the supply of gas from the gas supply source 107 is initiated and, also, the gas flowing through the second purifier 105 is collected by the gas discharging means 112. Thin arrows depict the gas flow in this case. --

Please substitute the paragraph beginning at page 31, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As described above, the gas from the supply source 107 flows to the second purifier 105. As a result, even if the second purifier 105 is exposed to the atmosphere during replacement of the same or the maintenance thereof so that a substance such as oxygen or water which absorbs the exposure light is attracted to it, the gas supply can effectively reduce the substance attracted to the second purifier. Further, at the first purifier 104 side, the gas can flow there even during the replacement of the second purifier 105 or the maintenance thereof. Therefore, the replacement or maintenance can be done without stopping the operation of the apparatus. --

Please substitute the paragraph beginning at page 31, line 14, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- During normal operation, the ceramics porous type chemical filter 504 functions as a water content removing filter. Therefore, after the apparatus is operated for a predetermined period of time, the purifier may be interchanged, such that the purification capacity of the purifier not used (second purifier 112 side in the drawing) may be recovered. The recovery level of the purification capacity may be discriminated on the basis of the gas flow time of the gas supply source 107 or, alternatively, a gas detector (not shown) may be disposed just after the purifier to check the level on the basis of the result of the detection. --

Please substitute the paragraph beginning at page 31, line 26, and ending on pag 32, line 6, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Figure 6B shows a state in which, to the contrary to Figure 6A, the gas from the fan 102 flows through the second purifier 105 side. The flow of gas from the fan 102 and the flow of gas from the gas supply source 107 as well as the replacement of the first purifier, for example, are all inverse to what has been described above and, therefore, a description thereof is omitted. --

Please substitute the paragraph beginning at page 32, line 24, and ending on page 33, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The heater 117a is controlled at a predetermined temperature in accordance with the detection by a thermometer 77a for detecting the gas temperature from a down-flow duct 76, and in response to a signal from a control unit 78. --

Please substitute the paragraph beginning at page 33, line 17, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas from the gas supply source 57 described above may be controlled at a predetermined temperature inside the gas supply source 57 or, alternatively, the piping path may be determined so that the pipe 58 or 61 extends through a space being temperature controlled as

described and the gas reaches the predetermined temperature until it arrives in the gas supply port 59 or 62. --

Please substitute the paragraph beginning at page 34, line 14, and ending on page 35, line 5, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas pressure from the pipe 80 is detected by a pressure gauge 701, and a control valve 702 is controlled by the control unit 78 (Figure 1), whereby a predetermined flow rate is controlled. The gas being controlled by the control valve to a predetermined flow rate flows through a collecting pump 703, and it is reserved into a buffer reservoir 704. Then, the gas is pressurized by a compressor 705 to a predetermined pressure, and caused to flow into the pipes 81a - 81c. Also, the gas flowpassage is branched between the pressure gauge 701 and the control valve 702, and the gas is discharged by a discharging pump 706. The discharging amount is controlled, as required, by a mass flow controller 708 in accordance with the detection by a pressure gauge 707, provided at the buffer reservoir 704. The mass flow controller 708 is controlled by the control unit 78 (Figure 1) on the basis of the detection by the pressure gauge 707. --

Please substitute the paragraph beginning at page 35, line 6, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- With the structure described above, the pressure inside the chamber 26 can be controlled continuously to be a constant pressure. As a result, the optical characteristic, which may otherwise be easily influenced by a pressure change, for example, the performance of the projection optical system 13 (Figure 1), can be maintained. --

Please substitute the paragraph beginning at page 35, line 21, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Further, the relative inside pressure difference between the chambers 26 and 4 can be kept at a predetermined level. This can be accomplished by using the above-described differential pressure gauge and by detecting the relative inside pressure difference between the pipe 80 (i.e., chamber 26) and the chamber 4. --

Please substitute the paragraph beginning at page 36, line 25, and ending on page 37, line 11, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- When the reticle 8 or the wafer 14 is to be unloaded outwardly, the gas supply is initiated in a state in which the gate valves 32, 33, 37 and 38 are closed. As the load-lock chambers reach a predetermined state, the gas supply is stopped. Subsequently, the gate valves 33 and 38 are opened, and the reticle 8 and the wafer 14 are unloaded from the apparatus by the conveying means 35 and 40, and then they are placed on the support tables 34 and 39 in the load-lock chambers 31 and 39, respectively. After this, the gate valves 33 and 38 are closed. Then,

the gate valves 32 and 37 are opened, and the reticle 8 and the wafer 14 are taken out by using separate means (not shown). --

Please substitute the paragraph beginning at page 37, line 12, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The foregoing description has been made of an example wherein loading and unloading of the reticle 8 and the wafer 14 to and from the apparatus are carried out simultaneously. However, as a matter of course, they may be done separately. --

Please substitute the paragraph beginning at page 37, line 17, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The gas replacement of the load-lock chambers 31 and 36 is made to avoid any influence to the inside environment of the chamber 26 to be caused when the gate valves 33 and 38 are opened. This is well known in the art. --

Please substitute the paragraph beginning at page 37, line 22, and ending on page 38, line 3, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- When a pellicle (not shown) is used for prevention of dust adhesion to the pattern surface of the reticle 8, the space enclosed by the reticle 8, the pellicle and a pellicle frame (not shown) for supporting the pellicle, should desirably be gas purged. In this connection, use of a

pellicle frame with even pressure bores (a frame formed with bores for communicating inside and outside the frame) is preferable. --

Please substitute the paragraph beginning at page 38, line 6, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As the operation of the apparatus starts, the inside of the chamber 26 and the inside of the gas circulation system 72 are kept in an atmospheric state. Thus, at the start of the operation, the gas supply from the gas supply source 57 to the projection optical system 13 and to the housing 6 is initiated. Also, gas discharging from the discharging port 87 to the gas discharging mechanism 86 through the pipe 88 is carried out. The ON/OFF control for this gas discharging operation is made by controlling a valve (not shown) provided in the gas discharging means 86 by use of the control unit 78. --

Please substitute the paragraph beginning at page 39, line 7, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Also, when the operation of the apparatus is to be started, if a predetermined replacement state should be established inside the chambers 4 and 26 in a short time or, alternatively, because in the load-lock chambers 31 and 36 the opening to the atmosphere and the gas replacement are repeated each time the reticle or the wafer is exchanged, the replacement should be completed in a short time for an improved throughput. Therefore, a vacuum pump may be used to forcibly evacuate the atmosphere from the gas discharging means 56 and 86 to

produce a vacuum in the inside spaces of the chambers 4 and 26 and of the load-lock chambers 31 and 36. After this, the gas purging may be carried out. In this case, the chambers 4 and 26 and the load-lock chambers 31 and 36 should have a sufficient rigidity so as to avoid that any deformation in the vacuum state adversely affects the performance of the apparatus. --

Please substitute the paragraph beginning at page 40, line 4, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Sequential operations for providing a vacuum inside the chambers and load-lock chambers and subsequently for supplying a gas thereinto, may be repeated plural times, as necessary. On that occasion, as compared with a single vacuum-setting operation, the reached vacuum level in the chamber or load-lock chamber may be a relatively low vacuum (higher absolute pressure), such that the cost for the vacuum pump or components can be reduced largely. --

Please substitute the paragraph beginning at page 40, line 13, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- In accordance with the embodiment of Figure 1, when the chamber 4 should be opened to the atmosphere for maintenance or the like, the purged state of the chamber 26 side can be maintained. On the other hand, when the chamber 26 is opened to the atmosphere, the purged state of the chamber 4 side can be retained. --

Please substitute the paragraph beginning at page 40, line 20, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- When a vacuum is to be produced in the reticle load-lock chamber 31, a pellicle frame with even pressure bores (not shown) as described above may be used, and unwanted damage of or breakage to the pellicle or reticle can be prevented. --

Please substitute the paragraph beginning at page 41, line 4, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- This embodiment differs from the preceding embodiment in that direction changing valves 801 and 703 and a bypass way 802 are added to the gas circulation system 72. Components corresponding to those of Figure 1 or 6 are denoted by the same reference numerals, and a description thereof is omitted. --

Please substitute the paragraph beginning at page 42, line 11, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As regards discrimination of whether the circulation system environment has reached the predetermined state, it may be done by controlling the time period in which the gas passes through the bypass way 802 by use of a control system (not shown). Alternatively, a gas detector (not shown) may be provided at a predetermined position inside the circulation system so that the discrimination may be made on the basis of the detection. The direction changing valves 801 and 803 may be changed automatically in accordance with the discrimination on the circulation

system environment state, or alternatively, they may be changed by using a control system (not shown). --

Please substitute the paragraph beginning at page 43, line 8, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As long as a decrease in the purity of the circulation gas within the chamber is in an acceptable range, the replacement of the purifier 104 or the maintenance thereof may be done in the period in which the gas flows through the bypass way. --

Please substitute the paragraph beginning at page 43, line 23, and ending on page 44, line 10, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- A wafer chamber 92 is a tightly closed container which accommodates therein a partial duct 23, an interferometer 18 and a wafer stage 15, for example. In this embodiment, the chamber 92 is mounted on the stage base table 21. Further, the wafer chamber 92 is connected to the barrel base 22 through a movable member 93 effective to secure the tightness and to absorb relative displacement. The movable member 93 is a bellows made of stainless steel. However, it may be a metal bellows made of nickel alloy or titanium, or it may be a resin bellows, provided that the tightness is secured and relative displacement can be absorbed thereby. Alternatively, in place of a bellows, a magnetic fluid seal may be used. --

Please substitute the paragraph beginning at page 45, line 2, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As regards the gas flows in the housing 6, the projection optical system 13 and the outer casing 24 as well as in the partial ducts 25 and 23, they are similar to what has been described with reference to Figures 1, 2, 3 and 4. Therefore, further description is omitted. --

Please substitute the paragraph beginning at page 45, line 22, and ending on page 46, line 17, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The temperature controlled chamber accommodates therein a down-flow duct 76 similar to that of the Figure 1 embodiment. The gas blown downwardly from the down-flow duct 76, which is temperature controlled air in this example, is discharged from a circulation outlet port 99 and is directed to an inlet port 1002 of an air circulation system 1001. There, the gas is mixed with an outside atmosphere supplied from an atmosphere inlet port 1003 and, then, it is blown by a fan 1004. Subsequently, the air is once cooled to a predetermined temperature by means of a cooling device 1005 and, thereafter, it is heated by a heater 1006 to a predetermined temperature. After this, the temperature controlled air flows from an outlet port 1009 again into a down-flow duct 98. The circulation path inside the temperature controlled chamber 98 is such as described above. The temperature of the air from the down-flow duct 76 is measured by a thermometer 77a provided inside the chamber 98, and a control system 1007 controls the heater

1006 on the basis of the temperature detection, whereby a predetermined temperature can be maintained. --

Please substitute the paragraph beginning at page 48, line 25, and ending on page 49, line 12, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Further, in this embodiment, the gas outside the dot pattern area A and inside the chamber 98 is temperature controlled air. However, the invention is not limited to this. An inactive gas may be used. On that occasion, the purity of the inactive gas used in the chamber 98 may be lower than that of the inactive gas in the dot pattern area A. The inactive gas used in the dot pattern area A may be introduced into the chamber 98 for reuse of it. Further, when a helium gas is used as a purge gas of the dot pattern area A, and if helium is used also for the purge gas of the chamber 98, a large quantity of helium gas is required. In consideration of this, nitrogen may be used on that occasion as a purge gas for the chamber. --

Please substitute the paragraph beginning at page 49, line 15, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Figure 11 shows a fifth embodiment concerning a modified example of the chamber 26 of Figure 1. Components corresponding to those of Figures 1 and 10 are denoted by the same reference numerals, and a description thereof is omitted. --

Please substitute the paragraph beginning at page 50, line 4, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As regards the gas flow inside the dot pattern area B, since it is similar to that of the Figure 10 embodiment, a description thereof is omitted. --

Please substitute the paragraph beginning at page 50, line 7, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- In this embodiment, in the air circulation system 1001, the circulation air is distributed to air outlet ports 1009a and 1009b at a predetermined flow rate distribution proportion. The outlet port 1009a directs the circulation air to the down-flow duct 76, as in the Figure 10 embodiment. The outlet port 1009b is connected to the partial duct 23 at the wafer side, through a pipe 1011. The temperature of the air blown from the partial duct 23 is detected by a thermometer 77d provided adjacent to the wafer stage 15 or adjacent to the discharging port of the partial duct. In accordance with the result of the detection and in response to a signal from control means 1007, heaters 1006a and 1006b are controlled, whereby a predetermined temperature is accomplished. --

Please substitute the paragraph beginning at page 50, line 22, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- The load-lock chamber 36 shown in Figure 10 may not be used in this embodiment. Thus, as compared with the embodiments of Figures 1 and 10, this embodiment has an advantage with respect to the apparatus throughput and, additionally, the structure can be made simple. --

Please substitute the paragraph beginning at page 51, line 1, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- As regards the light path from the bottom and of the projection optical system 13 to the wafer 14, the last optical element (not shown) inside the projection optical system 13 is disposed in proximity to the wafer 14 surface (about a few microns to a few hundred microns), while preventing adverse influence of light absorption to the apparatus performance. --

Please substitute the paragraph beginning at page 52, line 2, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- In this embodiment, the gas discharged from the partial duct 23 is temperature controlled air. However, the invention is not limited to this. An inactive gas may be used. On that occasion, the purity of the inactive gas discharged from the partial duct 23 may be lower than that of the inactive gas in the dot pattern area B. The inactive gas used in the dot pattern area B may be introduced into the partial duct 23 for reuse of it. Further, when a helium gas is used as a purge gas of the dot pattern area B, and if helium is used also for the gas to be supplied to the

chamber 98 and to the wafer peripheral portion from the partial duct 23, a large quantity of helium gas is required. In consideration of this, nitrogen may be used in place of helium. --

Please substitute the paragraph beginning at page 53, line 3, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Figure 12 is a schematic view of a general structure of the production system, in a certain aspect thereof. Denoted in the drawing at 2101 is a business office of a vendor (machine supplying maker) for providing semiconductor device manufacturing apparatuses. As examples of such production machines, here, pre-process machines (various lithographic apparatuses such as exposure apparatus, resist coating apparatus, etching apparatus, for example, and heat treatment apparatuses, film forming apparatuses, and flattening apparatus) and post-process machines (assembling machines or inspection machines, for example) are expected. Inside the business office 2101, there are a host control system 2108 for providing a maintenance database for the production machine, plural operating terminal computers 2110, and a local area network (LAN) 2109 for connecting these computers to constitute an intranet. The host control system 2108 is provided with a gateway for connecting the LAN 2109 to an internet 2105 which is an outside network of the office, and a security function for restricting the access from the outside. --

Please substitute the paragraph beginning at page 53, line 26, and ending on page 55, line 14, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- On the other hand, denoted at 2102 - 2104 are manufacturing factories of a semiconductor manufacturer or manufacturers as a user (users) of production machines. The factories 2102 - 2104 may be those belonging to different manufacturers or the same manufacturer (e.g., pre-process factory and post-process factory). In each of the factories 2101 - 2104, there are production machines 2106, a local area network (LAN) 2111 for connecting them to constitute an intranet, and a host control system 2107 as a monitoring system for monitoring the state of operation of the production machines 2106. The host control system 2107 in each factory 2102 - 2104 is provided with a gateway for connecting the LAN 2111 in the factory to the internet 2105 which is an outside network of the factory. With this structure, the host control system 2108 of the vendor 2101 can be accessed from the LAN 2111 in each factory, through the internet 2105. Through the security function of the host control system 2108, only admitted users can gain access thereto. More specifically, through the internet 2105, status information representing the state of operation of the production machines 2106 (for example, the state of the machine in which any disorder has occurred) may be transmitted as a notice from the factory to the vendor. Additionally, response information responsive to the notice (for example, information on how the disorder should be treated or software data concerning the treatment) as well as latest software and maintenance information such as help information may be supplied from the vendor. The data communication between each factory 2102 - 2104 and the vendor

2101 as well as the data communication through the LAN 2111 in each factory may use a communication protocol (TCP/IP) generally used in the internet. In place of using the internet, an exclusive line network (e.g., ISDN) having higher security in which no third party can access, may be used. Further, the host control system is not limited to the system as provided by the vendor. A database may be structured by the user and set in an outside network, such that it can be accessed from plural user factories. --

Please substitute the paragraph beginning at page 55, line 15, and ending on page 56, line 4, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Figure 13 is a schematic view of the general structure of the production system according to this embodiment, in another aspect thereof different from Figure 12. In the preceding example, plural user factories each having production machines and the control system of the vendor of the production machine are connected through an external network, so that, through this external network, information related to the production control in each factory or related to at least one production machine is data communicated. In this example, as compared therewith, a factory having production machines from different vendors and control systems of these vendors corresponding to the user production machines are connected with each other through an external network outside the factory, so that maintenance information for these production machines is data communicated.

Please substitute the paragraph beginning at page 57, line 14, and ending on page 58, line 23, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Each of the production machines in the factory may have a display, a network interface and a computer for executing network accessing software stored in a storage device as well as machine operating software. The storage device may be a memory or a hard disk or, alternatively, a network file server. The network accessing software may include an exclusive or wide-use web browser, and a user screen interface such as shown in Figure 14, for example, is provided on the display. Various information may be inputted into the computer (input items on the screen) by an operator or operators who control the production machines in the factory, such as, for example, machine type (2401), serial number (2402), trouble file name (2403), date of disorder (2404), emergency level (2405), status (2406), solution or treatment (2407), and progress (2408). The thus inputted information is transmitted to the maintenance database through the internet. In response, appropriate maintenance information is replied from the maintenance database to the user display. Further, the user interface as provided by the web browser enables a hyperlink function (2410 - 2412) as illustrated. As a result, the operator can access further details of information in each item, can get latest version software to be used for the production machine, from the software library provided by the vendor, or can get an operation guide (help information) for the factory operators. Here, the maintenance information as provided by the maintenance control system may include information related to the replacement of purifiers or the maintenance thereof, as described hereinbefore. Further, the

software library described above may provide latest software for specifying the timing for the purifier replacement or maintenance. Furthermore, the software library may support the ambience control inside the chamber as described hereinbefore. --

Please substitute the paragraph beginning at page 59, line 2, with the following. A marked-up copy of this paragraph, showing the changes made thereto, is attached in Appendix A.

-- Step 1 is a design process for designing a circuit of a semiconductor device. Step 2 is a process for making a mask on the basis of the circuit pattern design. Step 3 is a process for preparing a wafer by using a material such as silicon. Step 4 is a wafer process (called a pre-process) wherein, by using the so prepared mask and wafer, circuits are practically formed on the wafer through lithography. Step 5 subsequent to this is an assembling step (called a post-process) wherein the wafer having been processed by step 4 is formed into semiconductor chips. This step includes an assembling (dicing and bonding) process and a packaging (chip sealing) process. Step 6 is an inspection step wherein an operation check, a durability check and so on for the semiconductor devices provided by step 5, are carried out. With these processes, semiconductor devices are completed and they are shipped (step 7). --

<u>IN THE CLAIMS</u>:

Please CANCEL claim 25 without prejudice to or disclaimer of the recited subject matter.

Please AMEND claims 1, 3, 5, 12, 14, 19, 22, 24, 27, 34, 40-42, 44-46, 49 and 51-54, and ADD new claims 55-72, as follows. A marked-up copy of the amended claims, showing the